



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,534	09/22/2003	Shin-Tai Lo	2450-0548P	5928
2292	7590	05/16/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			LUI, DONNA V	
			ART UNIT	PAPER NUMBER
			2629	

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/665,534	LO ET AL.	
	Examiner	Art Unit	
	Donna V. Lui	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/22/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, Claims 1-6 in the reply filed on April 7, 2006 is acknowledged. The traversal is on the ground(s) that it should be no undue burden on the examiner. This is not found persuasive because Group II is directed towards a driving method that divides a picture frame into two periods whereas Group I does not. Further Group II does not require the particular structure as claimed in Group I for the current driving method.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claim 1** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Line 18 is not clear as to which or both limitations of the source is connected to the odd line enable or even line enable. Further there should be no parenthesis around the terms "even line enable". The parenthesis is reserved for abbreviations or referencing of numerals to drawings.

Claim Objections

4. **Claim 1** is objected to because of the following informalities: lines 12, 13, 15 and 17 have grammatical errors; the following are suggestions for correction.

Art Unit: 2629

- Line 12: a writing element having a source that connects to the data line;
- Line 13: a switching element having a gate that connects to the gate of the writing
- Line 15: a driving element having a gate that connects to the drain of the writing
- Line 17: a control element having a gate that connects to the scan line; and the

The claim should be one sentence and only have reference numerals to drawings or abbreviations in parenthesis. Therefore, examiner would like to suggest the following changes:

- Lines 3-4: the parenthesis should be removed
- Line 4: the period should be replaced by a comma
- Line 18: remove parenthesis

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Azami (Pub. No.: US 2001/0017618 A1) in view of Okuda (Patent No.: US 6,650,060 B2).

With respect to **Claim 1**, Azami teaches a current driving apparatus for an active matrix organic light emitting diode (*See figures 22 and 36A; [0277]; [0279]; [0322]: light emitting*

Art Unit: 2629

diode), which utilizes two abutting sub-pixels comprising an odd sub-pixel and an even sub-pixel ([0031], lines 3-9; note that the odd pixels are arranged in a column alternately with the even pixels). The driving apparatus of each sub-pixel includes: odd line enable for the odd sub-pixels (See figure 22, *Vref1_H*, *Vref1_L*; [0234]); even line enable for the even sub-pixels (See figure 22, *Vref2_H*, *Vref2_L*; [0234]) and a data line shared by the odd sub-pixels and the even sub-pixels (See figure 36A, 4806: *current supply ~ data line*; [0338]); a scan line (See figure 36A, 4803: *gate line ~ scan line*; [0337], lines 6-7); a supply line (See figure 36A, 4801: *source line ~ supply line*; [0337], line 5). Azami does not mention a common connection among the pixels, however it would have been obvious to a person of ordinary skill in the art to have a common line such as ground for the pixels so as to simplify circuit structure. For further reference, Okuda is cited to teach the common line (*ground*) as shown in figure 4.

Azami teaches a control element (See figure 10, *source selection circuit ~ control element*; [0144], [0145]) that connects to the scan line, odd line enable and even line enable (*scan line ~ SS1 and SS2*, *Vref1 ~ odd line enable*, *Vref2 ~ even line enable*). Although Azami teaches the use of switches for a control element it would have been obvious for a person of ordinary skill in the art to use a control element comprising a TFT for lower cost, smaller size, higher reliability and ability to control large currents. Through replacement of the switch with a transistor, the selection signals SS1 (odd) and SS2 (even) controls the gate, the source is connected to the odd line enable and even line enable (Output of the D/A converter circuit is used as the source signal based on odd line or even line enable signals as labeled respectively in figure 10 as *Vref1* and *Vref2*), and the drain is connected to the source line selection circuit.

Art Unit: 2629

Azami does not teach a writing element having a source that connects to the data line; a switching element having a gate that connects to the gate of the writing element and a source that connects to the data line; a driving element having a gate that connects to the drain of the writing element and a source that connects to the supply line, nor does Azami teach a storage element with two ends, one end connects to the source of the driving element and the other end connects to the connection of the gate of the driving element and the drain of the writing element; and a light emission element with two ends, one end is the positive electrode that connects to the drain of the driving element and the other end is the negative electrode that connects to the common line.

Okuda teaches a pixel circuit where a writing element having a source connects to the data line (*See figure 4, 45: TR2 ~ writing element, 34: IS1 ~ data line*); a switching element having a gate that connects to the gate of the writing element and a source that connects to the data line (*46: TR3 ~ switching element*); a driving element having a gate that connects to the drain of the writing element and a source that connects to the supply line (*32: TR1 ~ driving element, 38: source line ~ supply line*); and a storage element with two ends (*33: C1 ~ storage element*), one end connects to the source of the driving element and the other end connects to the connection of the gate of the driving element and the drain of the writing element; and a light emission element with two ends (*31: EL1 ~ light emission element*), one end is the positive electrode that connects to the drain of the driving element and the other end is the negative electrode that connects to the common line (*Ground*).

Okuda modifies the current driving apparatus of Azami by substitution of the pixel circuit such that the supply line, data line, and common line of Okuda are equivalent to those of Azami.

Art Unit: 2629

The connection of the pixel circuit of Okuda to the control element of Azami is done in such a way that the node common to transistors 45 and 46 of Okuda are connected to the drain of the control element of Azami. The modification results in a control element having a gate that connects to the scan line, a source that connects to the odd line enable or even line enable and a drain that connects to the gate of the switching element.

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use the pixel circuit of Okuda to the current driving apparatus of Azami so that the driving current can be controlled intentionally regardless of a variation in the characteristic of the driving transistor and variations in the driving current among the pixels can be suppressed so that the display quality can be improved (*column 2, lines 17-23*).

With respect to **Claim 2**, Okuda teaches the writing element is a transistor, however it would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a writing element that is a thin film transistor, as taught by Okuda in the current driving apparatus of Azami for higher reliability and faster response.

With respect to **Claim 3**, Okuda teaches the switching element is a transistor, however it would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a writing element that is a thin film transistor, as taught by Okuda in the current driving apparatus of Azami for higher reliability and faster response.

With respect to **Claim 4**, Okuda teaches the driving element is a thin film transistor

Art Unit: 2629

(column 4, lines 55-56). It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a driving element that is a thin film transistor, as taught by Okuda in the current driving apparatus of Azami for higher reliability and faster response.

With respect to **Claim 5**, Azami teaches the control element is a switch, however it would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a control element comprising a TFT for lower cost, smaller size, higher reliability and faster response.

With respect to **Claim 6**, Okuda teaches the storage element is a storage capacitor (column 4, lines 58-60). It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a storage element that is a storage capacitor, as taught by Okuda, to the current driving apparatus of Azami so as to reduce costs since displays require many storage elements for the pixels and capacitors are commonly used as storage elements.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donna V. Lui whose telephone number is (571) 272-4920. The examiner can normally be reached on Monday through Friday 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Donna V Lui
Examiner
Art Unit 2629

AMR A. AWAD
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", written in a cursive style with a large loop at the end.